

Unit 8

Day 1

Solving Quadratics with Square Root Property & by  
Factoring

$$ax^2 + bx + c = 0$$

## SQUARE ROOT PROPERTY

The solution set of  $x^2 = k$  is  $\{\sqrt{k}, -\sqrt{k}\}$  .

$$x^2 = 16$$

$$x = \pm \sqrt{16}$$

$$x = \pm 4$$

$$\sqrt{x^2} = \sqrt{16}$$

$$\sqrt{16} = 4$$

principle  
sq. rt.

## Solving Quadratic Equations using the Square Root Property

Ex1:

$$x^2 = 81$$

$$x = \pm 9$$

Ex2:

$$4a^2 + 11 = 7$$

$$4a^2 = -4$$

$$a^2 = -1$$

$$a = \pm \sqrt{-1}$$

$$a = \pm i$$

Ex3:

$$(2y+1)^2 = 12$$

$$2y+1 = \pm \sqrt{12}$$

$$2y+1 = \pm 2\sqrt{3}$$

$$2y = -1 \pm 2\sqrt{3}$$

$$y = \frac{-1 \pm 2\sqrt{3}}{2}$$

$$\left\{ \frac{-1+2\sqrt{3}}{2}, \frac{-1-2\sqrt{3}}{2} \right\} 2$$

Ex4:

$$\frac{2}{x} = \frac{x}{9}$$

$$x^2 = 18$$

$$x = \pm 3\sqrt{2}$$

## ZERO-FACTOR PROPERTY

If  $a$  and  $b$  are complex numbers, with  $ab = 0$ , then  $a = 0$  or  $b = 0$  or both.

## Solving Polynomial Equations using the zero-factor Property

Ex5:

$$2x^2 + 6x + 4 = 0$$

$$2(x^2 + 3x + 2) = 0$$

$$2(x+1)(x+2) = 0$$

$$x+1=0 \mid x+2=0$$

$$x=-1 \mid x=-2$$

$$\{-1, -2\}$$

Ex6:

$$9b^3 + 5b^2 = 4b^2$$

$$9b^3 + b^2 = 0$$

$$b^2(9b+1) = 0$$

$$b^2=0 \mid 9b+1=0$$

$$b=0 \mid 9b=-1$$

$$b=-\frac{1}{9}$$

$$\{0, -\frac{1}{9}\}$$

Ex7: HW pg 118 1,2,5-16 all & pg 136 7-10 all

$$z^4 + 3z^3 - 4z^2 - 12z = 0$$

$$z[(z^3 + 3z^2) + (-4z - 12)] = 0$$

$$z[z^2(z+3) - 4(z+3)] = 0$$

$$z(z^2 - 4)(z+3) = 0$$

$$z(z-2)(z+2)(z+3) = 0 \quad \{0, 2, -2, -3\}$$

$z=0 \mid z=2 \mid z=-2 \mid z=-3$